



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

December 9, 1858.

Sir BENJAMIN COLLINS BRODIE, Bart., President,
in the Chair.

The President announced that, under the provisions of the Charter, he had appointed the following Members of the Council to be Vice-Presidents :—

The Lord Wrottesley.
Major-General Sabine.
Thomas Bell, Esq.
John Peter Gassiot, Esq.
Sir Roderick Murchison.
The Rev. Dr. Whewell.

The President, on taking the Chair, addressed the Meeting as follows :—

GENTLEMEN,

ALTHOUGH I have already had the opportunity of offering to you my thanks for the great honour which you have conferred on me in placing me in this Chair, it is but fit that I should repeat them now, when we are assembled in a more formal manner, and when probably some Fellows are present who were not present at the Anniversary dinner. It is impossible that I should be otherwise than highly gratified by such an expression of the good opinion of a Society, which may justly be regarded as including a larger proportion of individuals distinguished for their knowledge and intelligence than any other in this country. At the same time I must own that my feelings on the occasion are somewhat modified when I see around me so many of our Fellows who have devoted their lives to scientific pursuits, and who in their respective departments have contributed so much more than I have done to the advancement of scientific knowledge. It is now long since the requirements of an arduous profession, and the public not less than the private duties belonging to it, compelled me to direct my attention to other objects, and in a great degree to relinquish those researches, to which during many

previous years I had been able to devote a large portion of my time, and which were to me the chief objects of interest during the early period of my life. Still, although I have ceased, except to a limited extent, to be a labourer in that field of science in which I laboured formerly, I have never failed to sympathize with those who in this respect were more happily situated, and to regard with satisfaction, or I ought rather to say with admiration, the grand results at which they have arrived in extending the boundaries of human knowledge.

If it were possible for any one of that small but illustrious band of philosophers,—who just two centuries ago were associated in Gresham College for the purpose of mutually communicating and receiving knowledge, and who there laid the foundation of the Society which is now assembled—to revisit the scene of his former labours, we may well conceive the delight which it would afford him to learn that the success of that noble enterprise had been so much greater than his most sanguine aspirations could have led him to anticipate. Not only would he find an ample development of sciences which were then in the embryo state of their existence, but he would find other sciences, not inferior to these in interest and importance, added to the list. He would find that, instead of a limited number of individuals who were then occupied with scientific inquiries, whose labours were held in little estimation by the general public, and even held to be objects of ridicule by the presumptuous and ignorant, there is now a large number devoted to the same pursuits, and successfully applying to them the highest powers of the human intellect. He would perceive that, instead of being confined as it were to a corner, the love of knowledge is gradually becoming extended throughout the length and breadth of the land; and that, of those whose position does not afford them the opportunity of penetrating to the inmost recesses of the temple of science, there are many who, having advanced as far as the vestibule, are enabled even there to obtain their reward, in the improvement of their own minds, and in being rendered more useful members of the community.

Now, to say that all that has been accomplished as to the cultivation of science in this country during the last two centuries is to be attributed to the Royal Society, would be an absurdity. As, in now far-distant times, the course of events led the ancient nations, first of Greece and afterwards of Rome, to the cultivation of literature, of

moral philosophy, of geometry, and of the fine arts ; so in these latter times, the course of events, taking another direction, has led the nations of Europe to the investigation of the physical sciences. The Royal Society has been one of the results of this movement ; but being once established it became itself a cause, and has been a most powerful and efficient instrument for the carrying on, and giving a right direction to, the movement in which it had itself originated. It has been the means of bringing those who have the same objects in view into communication with each other ; and we all know how the interchange of knowledge and opinions, and the spirit of emulation, tend, at the same time that they increase the energy and activity of the imagination, to correct and mature the judgment. Nor should we overlook the fact, that the institution of the Royal Society has always afforded an honourable distinction for those whose labours have contributed to build up the fabric of human knowledge,—a distinction which has this peculiarity, that it can never be obtained through favour or interest, while the selection of candidates for the Fellowship is as carefully and impartially conducted as is the case at present.

Among the portraits which we see around us is one of the Sovereign who granted us the charter by which we are incorporated, and who conferred the title of Royal Society on us. Whatever defects posterity may have discovered in the character of King Charles the Second, we are bound to express our obligations to him, not only for the charter which we hold, but for the real interest which he seems to have taken in our Society when it was yet in its infancy, and for the attention which he paid to it during the early period of his reign, at a time when the patronage of the Crown was of so much the greater importance, as there were but few among the public who sympathized with the new association in its pursuits, or were capable of estimating the objects for which it was established. Nor did His Majesty merely grant us a charter, but it was one especially suited to the genius and character of the English people. When nearly forty years afterwards the Académie des Sciences was founded by King Louis the Fourteenth, it was placed wholly under the dominion of the Crown. The number of its members was limited : those belonging to one of its sections received pensions from the State ; and when a vacancy occurred in any of the sections, it was necessary that the election of the new member should be confirmed by the Crown. Now we must not

find fault with the constitution of a Society which has earned for itself so lofty a reputation ; including in the list of its members the names of the most profound philosophers, and the greatest geniuses of the age, and of whose works all who are engaged in the pursuit of knowledge are justly proud ; but we cannot doubt that with us such a constitution, so different from that of every other corporation in this country, would have been very much less successful than that which we actually possess. The charter of the Royal Society leaves the management of its affairs entirely in the hands of the Fellows, without the interference of any higher power. No one, in virtue of his belonging to it, receives any pension or derives any other advantage from the Government, and our funds are supplied altogether by ourselves. The sum of £1000, for some time past, has been annually voted by Parliament for the promotion of science. The Royal Society have undertaken the task of suggesting to the Treasury the manner in which this may be most usefully and economically distributed, the duty of accomplishing this object being devolved on a committee specially appointed for that purpose. But from this Parliamentary grant the Royal Society derives no special advantage, it being applied indifferently, for the purpose of supplying apparatus or other means of carrying on scientific inquiries, whether these inquiries belong to their own Fellows or to other persons. Being thus independent of the powers by which the State is governed, and having no other object than that of observing the physical phenomena of the universe, and tracing the laws by which they are regulated, the Royal Society has always pursued its course free from political excitement, and beyond the influence of anything in the shape of party politics. The effect of this has been not to sever the connexion which ought to exist between an institution of Royal foundation and the State, but to cause that connexion to manifest itself only by mutual exchange of good offices. The Royal Society has been always ready to lend its assistance to the Government whenever they required it, either in the way of giving their opinion on scientific questions, or in that of carrying out any public work ; and I may add, that thus they have been enabled, not in a few, but in numerous instances, to render good service to the community ; while, on the other hand, they are indebted to the Government, first, for the apartments in Somerset House, formerly allotted to them by King George

the Third, and now for the more ample accommodation granted to them by Her present Majesty.

When the Royal Society was first established, there was no other Society devoting itself to the pursuit of any branch of knowledge; and hence it was that many communications were made on subjects not strictly belonging to those sciences, to which it was intended that their attention should be more especially directed. If we refer to their earlier publications, we find in one of them a scheme for a universal alphabet; in another, a dissertation on the Chinese language. Father Gaubil, a missionary belonging to the order of Jesuits, sends them a map of Pekin, with an exact account of the imperial palace. An English merchant gives a history of his journey to Aleppo and Tadmor; others describe the discovery of tessellated pavements and other Roman antiquities. In short, there is scarcely any one department of knowledge, whether it be philology, history, antiquities, medicine, geography, political economy, and even metaphysics, which is not to a greater or less extent represented in the Philosophical Transactions. But all this time knowledge of all kinds was rapidly increasing, *vires acquirens eundo*. The time arrived when a division of labour was required, and the Royal Society discovered the necessity of confining themselves to their more legitimate pursuits. In the year 1717 the institution of the Society of Antiquaries attracted one large class of communications from them. After an interval of seventy years, the Linnean Society was founded for the cultivation of natural history; and I need not enumerate the various other societies which have been since called into existence, and which are now pursuing their course, not as rivals of the Royal Society, but as cooperators with it in the great work of exploring the phenomena of the universe. Whatever may have been the apprehensions which some may have entertained formerly, the event has proved that these new institutions have in no degree interfered with the reputation and usefulness of that from which they derived their origin. Indeed, without such fellow-labourers as these it is difficult to understand how, in the present state of knowledge, the Royal Society could have met the expectations of the scientific portion of the community. There would have been no means of recording a vast number of valuable details, from which important conclusions may be drawn in after-times. At the same time, we need

only refer to the volumes of the Philosophical Transactions, published since the beginning of this century, to be satisfied that the disposition to communicate the higher class of investigations to the Royal Society is not less than formerly. It is, indeed, the interest of every one who is ambitious that his name as a discoverer should be transmitted to posterity, that his works should have a place in the Philosophical Transactions, where, as has been observed by a writer in the *Edinburgh Review*, "He has the benefit of the great name acquired by that distinguished body, by the labours of Newton and Halley and Cavendish, and by two centuries of constant services performed to the commonwealth of letters*."

With the exception of the achievements of those small communities of ancient Greece, to whose works we still refer as affording the highest standard of excellence in literature and the fine arts, and from whom has been transmitted to us that marvellous science of geometry which enabled Newton to unravel the system of the universe,—with this exception, there is nothing in the history of what belongs to the advancement of knowledge so remarkable as the progress which the European nations have made in the cultivation of the physical sciences during the last two hundred years. It is not only those who are engaged, as you are, in researches of this kind, that must contemplate with satisfaction the results of this movement. The moral philosopher, recognizing in the desire of knowledge one of the noblest of our aspirations, will regard the extension of that desire, and the more general diffusion of knowledge, as an important means of elevating our species in the scale of intellectual beings. The unprejudiced theologian will allow that there is no better foundation for the religious sentiment than the study of natural phenomena, opening as it does to our view everywhere examples of design, and of the adaptation of means to ends, combined with mighty power and benevolent intention. The philosophical statesman, who, contemplating the progress of society, endeavours to explain the changes which it has undergone, and thence to anticipate the future, cannot fail to perceive that the cultivation of the physical sciences has been in these later times one of the most important instruments of civilization; while the mere utilitarian, however little he may be capable of estimating knowledge for its own sake, must admit that it has contri-

* *Edinburgh Review*, 1811.

buted more than anything else to the comforts and conveniences, not of one order only, but of every order of the community, from those who dwell in palaces to the tenants of cottages and garrets. I need not occupy your time by adducing particular instances of the benefits to which I allude ; and indeed they are so obvious, that I should not have thought it worth while to allude to them at all, if it were not that they show how complete a refutation the lapse of time has afforded of the views of those short-sighted cynics, among whom I am sorry to include even so distinguished a person as the author of Gulliver's 'Travels,' who formerly opposed or ridiculed the Royal Society, as if it were engaged in trifling pursuits of no advantage to mankind.

Science has already arrived at great results, far beyond what could have been reasonably anticipated. But the inquisitive mind, looking into the future, will find reason to believe that if we could lift up the veil by which it is concealed, we should find that there are other and still greater results reserved for those who will come after us, and which even some of those who are now among us may live long enough to witness. Astronomy has been said to be the most perfect of all the sciences ; and some time since it might have been supposed that, as regards it, we had not the power of carrying our researches much further. But the observations of Lord Rosse, penetrating by means of his improved telescope into the more remote regions of space, have enabled him to determine the nature of the so-called nebulous matter, and to enter on a new order of inquiries respecting the construction of the universe. The needles which now vibrate in the magnetic observatories which have been established in different regions of the earth, under the direction of the Treasurer of our Society, have already not only made us acquainted with many important facts connected with terrestrial magnetism, but have disclosed to us some remarkable relations between the earth and the sun, of which we had no conception previously. But these magnetic observations are still in progress, and if not prematurely brought to a conclusion, it would be unreasonable to doubt that they must lead to still more important discoveries as to the operation of a force, which, probably like that of gravity, pervades the universe, and places even the most distant parts of it in connexion with each other. A Fellow of our Society—devoting to it his time, his fortune, and his intellectual powers—is in a fair way to attain the great object

of his life, in the construction of an arithmetical engine of far superior capabilities to any previously invented by himself or others; such as may not only be a lasting monument of profound mathematical knowledge, of inventive genius, and of that perseverance amid difficulties which is one of the highest attributes of genius; but may be of great use to mankind hereafter, by solving with unerring certainty problems which practically are in any other way beyond the reach of the human intellect.

It is merely because it happened that they first occurred to me, that I have adduced these instances of investigations which are now going on, but of which the principal results remain to be worked out hereafter. I need not tell you that analogous instances might be furnished from almost every department of knowledge. If we add to these the number of investigations of a more limited kind, each complete within itself, which every year produces, also bearing in mind how great an influence the cultivation of the physical sciences during the last century has exercised on our social system, and how much it has contributed to give to modern civilization its peculiar character, we may well ask, what may not be the effect of a continuance of the same spirit of inquiry during the century which is to come? In considering such a question, it must be remembered that, whenever any addition has been made to the general stock of knowledge, the practical application of it to the ordinary purposes of life, for the most part, is made not immediately, nor until a long time afterwards. In the year 1739, the Rev. Dr. Clayton, at that time Dean of Kildare, communicated to the Royal Society his experiments on the distillation of coal, and his discovery of what he called "the spirit of coal." This spirit he confined in bladders, and occasionally diverted his friends by puncturing one of them near a candle, thus exhibiting a bright flame which issued from the puncture, until the whole of the spirit in the bladder was exhausted. Now the application of this discovery seems, as we see it now, to have been sufficiently obvious, yet nearly sixty years elapsed before Mr. Murdoch was led to avail himself of it for the purpose of lighting a factory in Manchester. In the year 1800, Volta, following up the researches of Galvani, discovered the effect which the multiplication of metallic plates has of increasing the electric force. About five years afterwards Davy began that grand series of experiments, in which he succeeded in

decomposing the alkalies and earths by means of an apparatus similar to that invented by Volta, but of larger extent and greater power. But very many years yet elapsed, and many improvements and modifications of the battery had been effected, before the same method was made use of for the purpose of electro-plating. Early in the present century, Davy published an account of the effects produced on the nervous system by the respiration of the nitrous oxide. It was afterwards ascertained by physiologists that the respiration of the vapour of ether operates in a similar manner, symptoms, like those of intoxication, being followed by a temporary loss of sensibility. But it was still many years afterwards that it first occurred to a dentist in America that the respiration of ether might be employed for the purpose of producing insensibility to pain during surgical operations. The time may often be long deferred, but our experience warrants the assertion, that there are very few of the discoveries which have been made in the physical sciences which have not, sooner or later, directly or indirectly, had the effect of promoting the well-being, the convenience, and comforts of mankind. As it has been hitherto, so we may expect it to be hereafter. In the meanwhile, the Royal Society, gathering to itself those who are most eminent as cultivators of any branch of natural philosophy, has no small share of responsibility, and has important duties to perform. It may encourage the deserving; it may lend a helping hand to those who want it; it may, as it always has done, render assistance to the Government where such assistance is required. Nor am I arrogating too much for the Royal Society when I say that it has still another function, which it even now exercises, not less substantially and really because the Fellows of the Society are themselves unconscious of it. Of the value of knowledge I apprehend that few at the present day will venture to express a doubt. But in all ages much of that which has been given to the world as knowledge has been no knowledge at all; and from this evil even the present age, in spite of the efforts made for the improvement of education, is not exempt. An institution such as ours is in this respect a great safeguard to the public. Here individuals engaged in pursuits which require accurate observation and cautious induction, are brought more or less into communication with each other. Mistakes as to matters of fact, and too hasty conclusions, are alike corrected. Though not

in any regular and formal manner, whatever is put forth under the pretence of it being knowledge, is submitted to a competent tribunal, whose decisions silently and imperceptibly pervade general society, and go far towards exposing the shams and impostures of the day.

But I feel that I am occupying too large a portion of the time which belongs to this evening's meeting, and that I owe you my apologies for doing so. Allow me, however, to make one more observation, which will, I feel sure, have the cordial assent of every one who hears me; namely, that it is desirable that the Royal Society should persevere in the independent course which it has hitherto pursued, relying on its own character and on the exertions of its Fellows, seeking no adventitious aid, and satisfied with the conviction that no one can labour in the acquirement of knowledge without, sooner or later, rendering service to mankind.

On the motion of Dr. Charles Holland, the thanks of the Society were voted to the President for his Address, and he was requested to allow the same to be printed in the 'Proceedings.'

The following communications were read:—

- I. "Researches into the Nature of the Involuntary Muscular Tissue of the Urinary Bladder." By GEORGE VINER ELLIS, Esq., Professor of Anatomy in University College, London. Communicated by Dr. SHARPEY, Sec. R.S. Received November 6, 1858.

(Abstract.)

In the present communication the author endeavours to show, that the involuntary muscular tissue of the bladder and the voluntary muscle in other parts of the human body have a like composition, and that Prof. Kölliker's view, that involuntary or smooth muscle is made up of fusiform cells, is incorrect. On the contrary, the muscular substance of the bladder is composed of lengthened fibres with fixed and tendinous terminal attachments. The fasciculi of muscular fibres in the bladder are interwoven into a network, and are marked at varying intervals by tendinous intersections, like those of the Rectus abdominis on a small scale.

The author terms what are usually called the 'nuclei' of the muscular tissue—'corpuseles,' and distinguishes two varieties of them,